

HEALTH HAZARDS OF SMOKE

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ABSTRACT

Each fire season 20,000 to 30,000 firefighters are engaged in suppressing wildfires on federal, state, and private lands in the United States. The National Wildfire Coordinating Group (NWCG) has assigned the Missoula Technology and Development Center (MTDC) the responsibility to coordinate the national effort and serve as the focal point for on-going and future studies on the effects of wildland fire smoke on firefighters.

MTDC has developed a 5-panel display that provides a brief historical perspective of work done in the 1960's-1980's on wildland fire smoke, identifies hazardous components of smoke, and shows on-going work being done on wildfires and prescribed burns to evaluate the physiological effects of smoke on firefighters.

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IGNITION PROBABILITY OF ORGANIC SOILS

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ABSTRACT

Prescribed fire requires a greater understanding of the fire behavior of organic soils; will they ignite and if they do how much heat will be transferred into the ground? The former of these concerns is the subject of this study: ignition results in flameless smoldering combustion that travels through the organic soil at very slow rates of spread near 3 centimeters per hour.

Ignition depends primarily on moisture content, but is also dependent on inorganic content and organic bulk density (also expressed as concentration of organic material per unit volume). Ignition was determined from about 30 samples brought from the field and subjected to an ignition test. Samples were 10 centimeters by 10 centimeters by 5 centimeters collected from Alaska and northern and southeastern U.S. Inorganic content was determined from a subsample of each sample. The moisture content was altered by adding or removing (drying) moisture from each sample with the intent of establishing a moisture range that passes through the ignition limit. The organic bulk density was determined from the volume of the sample and its mass corrected for moisture and inorganic content.

Samples were contained in an insulated box open at the top. Ignition was attempted on the 5 centimeters deep side below the surface from a glowing red coil held near the side for 3 minutes. Ignition was successful if the sample completely burned. The dichotomous results (burn and no burn) were analyzed through logistic regression to give a probability of ignition based on the sample variables.

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